research bulletin

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THE EDIBLE CITY

TERMITES IN TORONTO: A STATISTICAL REVIEW

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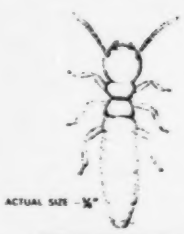
CITY OF TORONTO PLANNING AND DEVELOPMENT DEPARTMENT RESEARCH AND INFORMATION SECTION JUNE 1983

Termites are a problem in Toronto. These wood-eating insects can cause serious structural damage to homes and other buildings. For years now, they have been spreading slowly but surely across the City and adjacent municipalities. Through its ongoing termite control program the City has won virtually every battle against the termites, preventing further damage to each property that is treated. But the City is losing the war. Each year new cases of infestation are discovered and new neighbourhoods affected.

The City of Toronto, through its Commissioner of Buildings and Inspections, has recently retained a consultant to draw up plans for a new 1983 offensive against termites. The Ontario Government, too, has grown alarmed at the escalating demand for termite control grants and is reassessing its role in the termite war. This bulletin sets the scene for the initiatives, documenting what has happened to date in the City of Toronto and pointing out some of the lessons and possible strategies for the upcoming campaign.

Know your Termites!



WORKER

Small grayish-white insect similar to ant except has a thick waist and straight antennae, not elbow-shaped. Nests underground, comes up through tunnels to attack wood and cellulose containing materials. Avoids contact with air.

SOLDIER

Similar in appearance to worker termite except for larger, elongated head with larger jaws used to kill enemies. Otherwise similar in appearance to the worker termite.

QUEEN

Small brownish or black ant-size insect with thick waist, two pairs of whitish opaque wings of equal length. Swarms in spring and fall. Lays eggs to start colonies of workers and soldiers. Does not attack wood.

Infestation a Serious Problem

About 360 or 15% of the City's residential blocks are known to have been subject to termite infestation in one or more properties. These blocks contain about 22,000 or 20% of the City's house form buildings. Termite infestation has been identified and treated in about 3,000 of these houses. If all the remaining 19,000 houses in these blocks become infested, the cost of treatment alone is estimated to be about $38 million in current dollars. This figure could be close to $60 million if the cost of repairing structural damage caused by termites was included. At present the annual losses related to termites in residential properties alone, not allowing for any effect on real estate values, are roughly estimated as $1.3 million in the City of Toronto.

Though the termite situation is most serious in the east end of the City, which accounted for about 87% of the houses treated under the grants program and 78% of the blocks subject to infestation, the problem is growing significantly in other areas as well. If left unchecked, infestation could spread throughout Metro and could conceivably affect almost the entire stock of single family type dwellings, and many commercial properties as well. (Larger buildings are generally not affected because little wood is used in their construction.)

Termites Hard to Detect

Southern Ontario, including Toronto, has only one strain of termites: the Eastern Subterranean type (technically known as Reticulitermes flavipes or Kollar). In colour and size it resembles a grain of rice. Termites live in moist soil in colonies. These colonies are almost impossible to detect and eliminate as they may exist deep in the ground. Occasionally colonies may be found in certain varieties of trees but they cause no serious damage to living and healthy trees. Each colony sends out foragers in search of food, and their food is mainly cellulose extracted from wood.

Termites are social insects divided into reproductive (king and queen), soldier and worker castes. Worker termites are the ones which do the actual damage to the property by attacking and feeding on wood in buildings. The workers build earthen shelter tubes or tunnels on walls, foundations, and other surfaces to enter the building through holes, cracks or other openings. After feeding themselves, the

This bulletin highlights the findings of a comprehensive study: "Termites in Toronto — A Review and Evaluation of the Termite Control Program". The study was carried out by the Research and Information Section of the Planning and Development Department, in co-operation with the Buildings and Inspections Department, and is now being submitted to City Council. Copies of the full study report are available from the City's Information Resource Centre (947-7341).

workers return to the colony and regurgitate the digested wood as food for members of other castes. While entering and feeding on the inside of wood termites leave no outward sign of damage and after they leave the shell surface of the wood is left intact. Their presence, therefore, may not be discovered before considerable damage has already occurred. Discovery of shelter tubes is generally the only clear sign that the property is being attacked.

A Postwar Problem

The earliest evidence of presence of termites in Ontario was found at Point Pelee in 1929 and again in 1931. In Toronto they were first discovered on the shore of Toronto Bay in 1938. It is believed they were brought here from the U.S.A. in a shipment of infested material. Significant damage to property was first noticed in the City in 1944. By 1949 infestation had become established in several locations in the east end. By 1962 it was discovered in other sections of the City and Metropolitan Toronto, and by 1965 had affected 160 City blocks. Five years later the count showed about 200 infested blocks, some of them in the previously untouched west end. By the end of 1982 termite infestation had been documented in 362 City blocks. (Map 1 includes additional blocks in Kensington NIP area and Wards 10 and 11.)

The City's Control Program

The City of Toronto obtained enabling legislation from the Province in 1963, and established a Termite Control Program in 1965. Under the Program as currently instituted, homeowners can receive termite control grants from the Provincial Ministry of Environment equal to 60% of the cost of chemical treatment of soil and of breaking direct contact between wood structural members and soil, up to a maximum of $2,000. On the average about two out of every three infested houses need wood - soil separation work which costs about $2,100. The average cost of chemical treatment is about $550. Currently between 400 and 450 termite control grants are being approved annually in the City. The Ministry of the Environment also gives grants up to $1,000 for chemical treatment of soil prior to construction of new houses in areas subject to termite infestation. In addition, homeowners are eligible for a grant from the City, up to a maximum of $125, towards the cost of chemical treatment and repair of termite damage. In a Green Paper released in November 1982, the Ministry proposes to reduce the amount of the maximum grant given by the Province to $750, and suggests that the maximum grant given by the City be increased to $500.

From its inception in 1965 to the end of 1982, the control program has helped more than 3,000 homeowners many of whom would not otherwise have been able to afford the entire cost of treatment.

Though the grants are applicable predominantly to residential house form buildings, the Control Program applies to all residential and non-residential properties for purposes of enforcement. However, because of the City's limited financial and administrative resources, the enforcement program has so far been forced to concentrate on residential properties.

Infestation Being Discovered at an Increasing Rate

The statistics in this bulletin are based on the number of houses treated for infestation under the grants program. They therefore understate the termite problem because they do not take into account cases treated privately for which no information is available, or cases where termite infestation has gone undetected or untreated. Figure 1 indicates year to year growth from 1965 to the end of 1982 as reflected in the number of houses treated.

Up to the end of 1982 one or more cases of infestation had been recorded in 362 City blocks, and houses had been treated in 301 residential blocks. In the remaining 61 infested blocks no houses were treated under the grants program. The total number of houses treated was 3,283 but this included 424 houses in Kensington area treated in the 1976 - 1980 period and paid for entirely under the Kensington Neighbourhood Improvement Program. These were covered by the "entire block treatment" approach, irrespective of whether every one of them was infested or not. As only a small percentage of these houses would have been normally treated under the grants program, their inclusion in the statistics exaggerates the growth and intensity picture in the Central Area (Ward 6) relative to other areas. Therefore, in the interest of consistency the 424 houses and six blocks treated exclusively under the Kensington Neighbourhood Improvement Program are excluded for purposes of the analysis which follows. However, blocks and houses in Kensington which were subject to treatment under the normal termite control program grants are included.

Table 1 shows houses treated since the inception of the City's termite control program. The continuing year to year increase, both in the number of houses being treated and the number of new blocks where such houses are located, reflects not only the spread of infestation (which can move forward before it is detected), but also greater public awareness of the problem, increased inspection and treatment activity starting in the mid 70s, and a more generous provincial grants program from 1977 onwards.

Map 1 shows the growth of termite and carpenter ant infestation including Wards 10 and 11 and Kensington Neighbourhood Improvement Program Area.

In 1965, which was the first year of the control program, 67 houses were treated in 25 City blocks. Since then the number of houses being treated has been increasing steadily. The numbers almost doubled in the period 1971–1975 over the initial period from 1966–1970, increasing from an average of 63 houses per year to 12 houses per year. For the period 1976–1980 the figure more than doubled again to an average of 257 houses per year. In 1981 and 1982, the actual annual total was 281 and 313 houses respectively (Figure 1).

Carpenter Ants

The enabling provincial legislation, as well as the City's Termite Control Program (but not the provincial grant), apply to the control of termites as well as other wood destroying insects including carpenter ants which do not belong to the termite family. Compared with termites, carpenter ant infestation poses a considerably lesser threat and can be treated more easily at a smaller cost. As treatment for carpenter ants lasts for a much shorter period compared with that for termites, it has to be repeated subsequently if infestation recurs. In maintaining statistics City officials did not distinguish, until recently, whether infestation was by termites or carpenter ants. In the north end, Wards 10 and 11, however, it is known that the 95 houses (in 78 blocks) treated so far, and presumably the six blocks reported infested prior to 1965, were all subject to carpenter ant infestation. Data on these wards are therefore excluded from the statistics in this Bulletin. Elsewhere in the City carpenter ant infestation is estimated to account for about 5% of the treated cases.

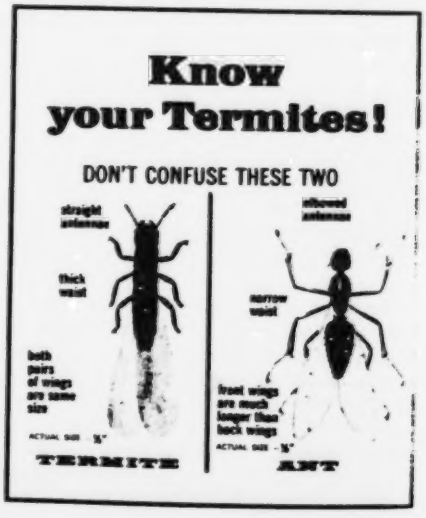


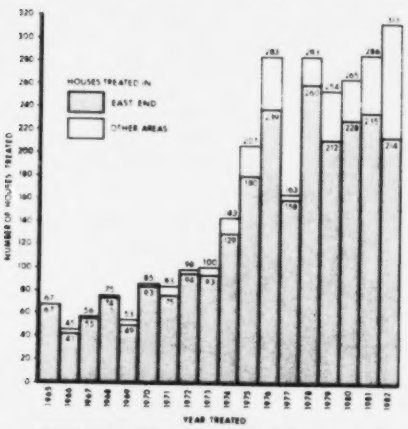
TABLE 1

Distribution of Houses Treated Under Termite Control Program*

Areas	Number of Houses Treated by Period											
	1965		1966-1970		1971-1975		1976-1980		1981-1982		Total 1965-1982	
	#	%	#	%	#	%	#	%	#	%	#	%
East End	67	100	302	96	571	90	1097	88	449	75	2486	87
Central – Ward 6	-	-	9	3	42	7	53	4	41	7	145	5
West End	-	-	3	1	17	3	88	7	83	14	191	7
North (Ward 5 only)	-	-	-	-	1	-	10	1	26	4	37	-
Total	67	100	314	100	631	100	1248	100	599	100	2859	100

*Excluding Kensington Neighbourhood Improvement Program Area and Wards 10 and 11

FIGURE 1
Historical growth and intensity of termite (and carpenter ant) infestation based on the number of houses treated under the Termite Control Program by areas, 1965-1982.*



*Excluding Kensington Neighbourhood Improvement Area and Wards 10 & 11.

TABLE 2

Number of Blocks Where Infestation Was First Recorded and/or Treated

Period First Recorded or Treated for Infestation	Blocks Where One or More Properties Recorded as Infested		Blocks Where One or More Houses Were Treated	
	Number	Cumulative Number	Number	Cumulative Number
Pre 1965	152	152	-	-
1965	7	159	25	25
1966–1970	27	186	48	73
1971–1975	35	221	56	129
1976–1980	62	283	83	212
1981–1982	73	356	83	295
	356		295	

*Excluding Kensington Neighbourhood Improvement Program Area and Wards 10 and 11

No Longer Just an East End Issue

Though in absolute terms the termite problem looks small in areas other than the east end, the rate of growth has been rapid, particularly in the west end. In terms of total number of houses treated in the City, the share of areas other than the east end has increased from 4% in 1966–1970, to 10% in 1971–1975, to 12% in 1976–1980, and to 25% in 1981–1982 (Table 1).

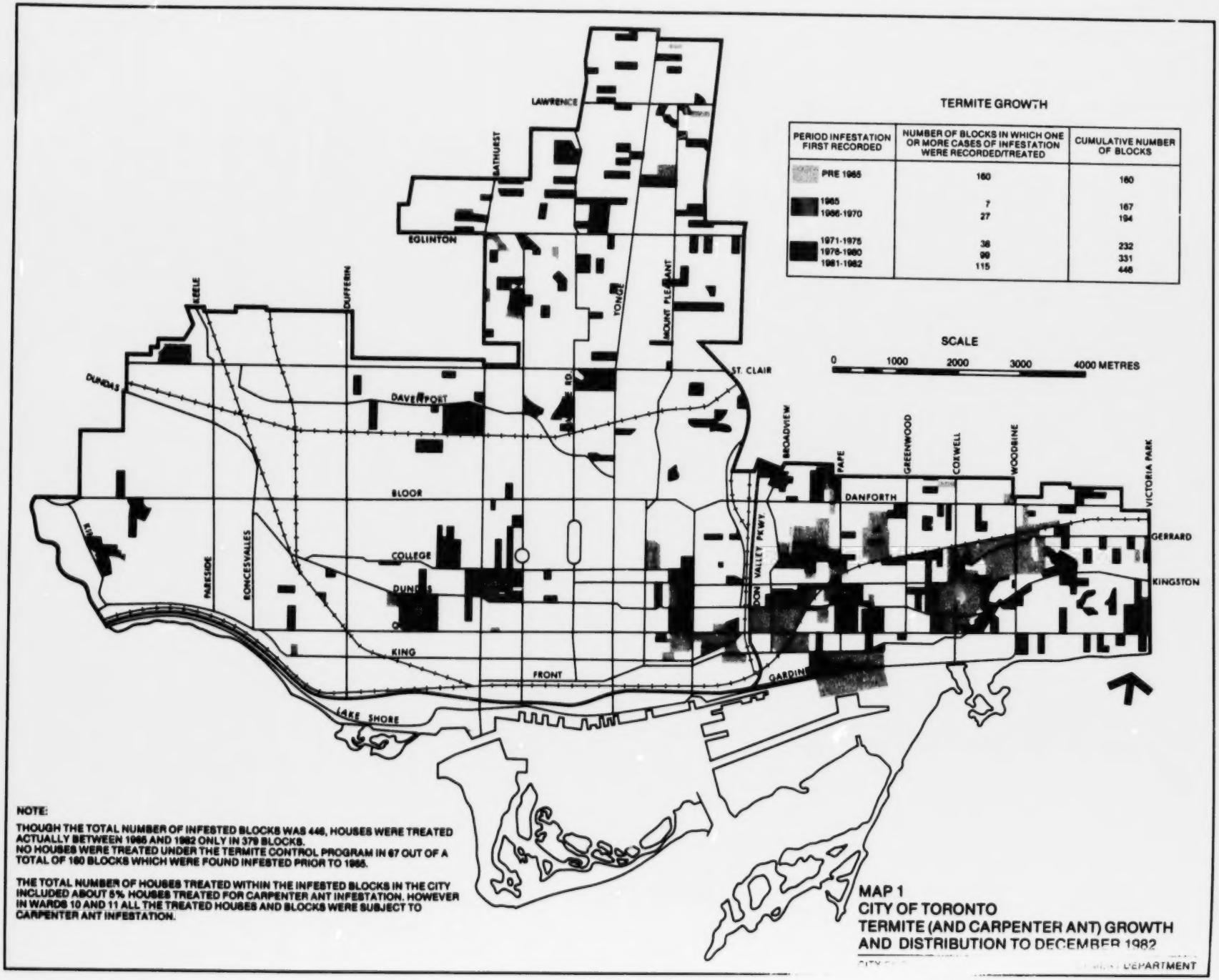
The intensity of infestation in various geographic areas of the City was analysed by looking at the number of houses treated in each block as a percentage of all the house form buildings within that block. (Map 2 – includes Wards 10 and 11 and Kensington Neighbourhood Improvement Program area.)

TABLE 3

Heavily Infested Blocks

(blocks in which more than 20% of house form buildings treated under the Termite Control Program)

	Heavily Infested Blocks	Total Blocks Treated	Percentage
East	75	231	32
Central (Ward 6)	5	20	25
West	6	26	21
North (Ward 5 only)	-	18	-
Total City	86	295	30



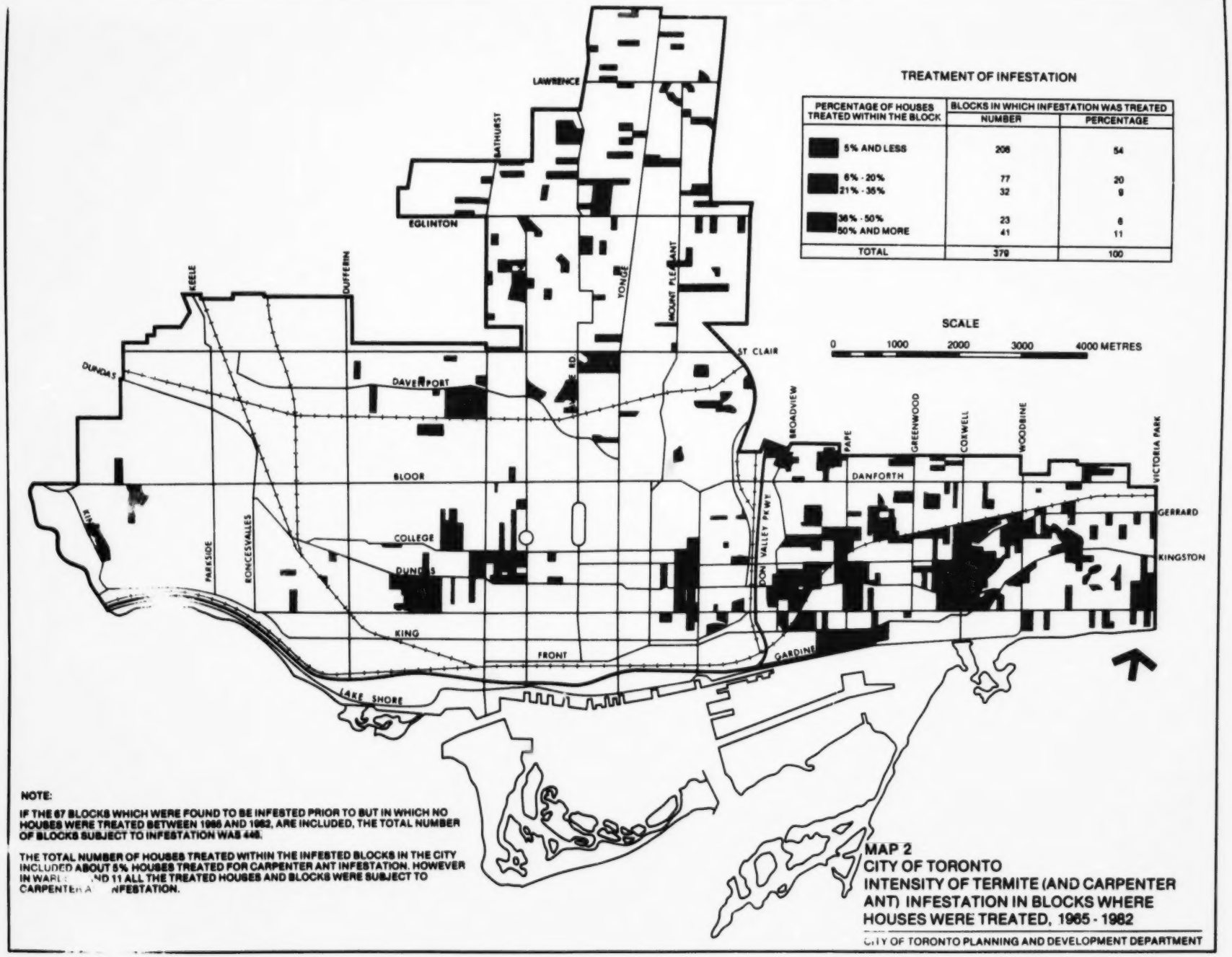
NOTE:

THOUGH THE TOTAL NUMBER OF INFESTED BLOCKS WAS 446, HOUSES WERE TREATED ACTUALLY BETWEEN 1966 AND 1982 ONLY IN 379 BLOCKS.
NO HOUSES WERE TREATED UNDER THE TERMITE CONTROL PROGRAM IN 67 OUT OF A TOTAL OF 160 BLOCKS WHICH WERE FOUND INFESTED PRIOR TO 1965.

THE TOTAL NUMBER OF HOUSES TREATED WITHIN THE INFESTED BLOCKS IN THE CITY INCLUDED ABOUT 5% HOUSES TREATED FOR CARPENTER ANT INFESTATION. HOWEVER IN WARDS 10 AND 11 ALL THE TREATED HOUSES AND BLOCKS WERE SUBJECT TO CARPENTER ANT INFESTATION.

MAP 1
CITY OF TORONTO
TERMITE (AND CARPENTER ANT) GROWTH
AND DISTRIBUTION TO DECEMBER 1982

CITY [illegible] DEPARTMENT



TREATMENT OF INFESTATION

PERCENTAGE OF HOUSES TREATED WITHIN THE BLOCK	BLOCKS IN WHICH INFESTATION WAS TREATED	
	NUMBER	PERCENTAGE
5% AND LESS	206	54
6% - 20%	77	20
21% - 35%	32	9
36% - 50%	23	6
50% AND MORE	41	11
TOTAL	379	100

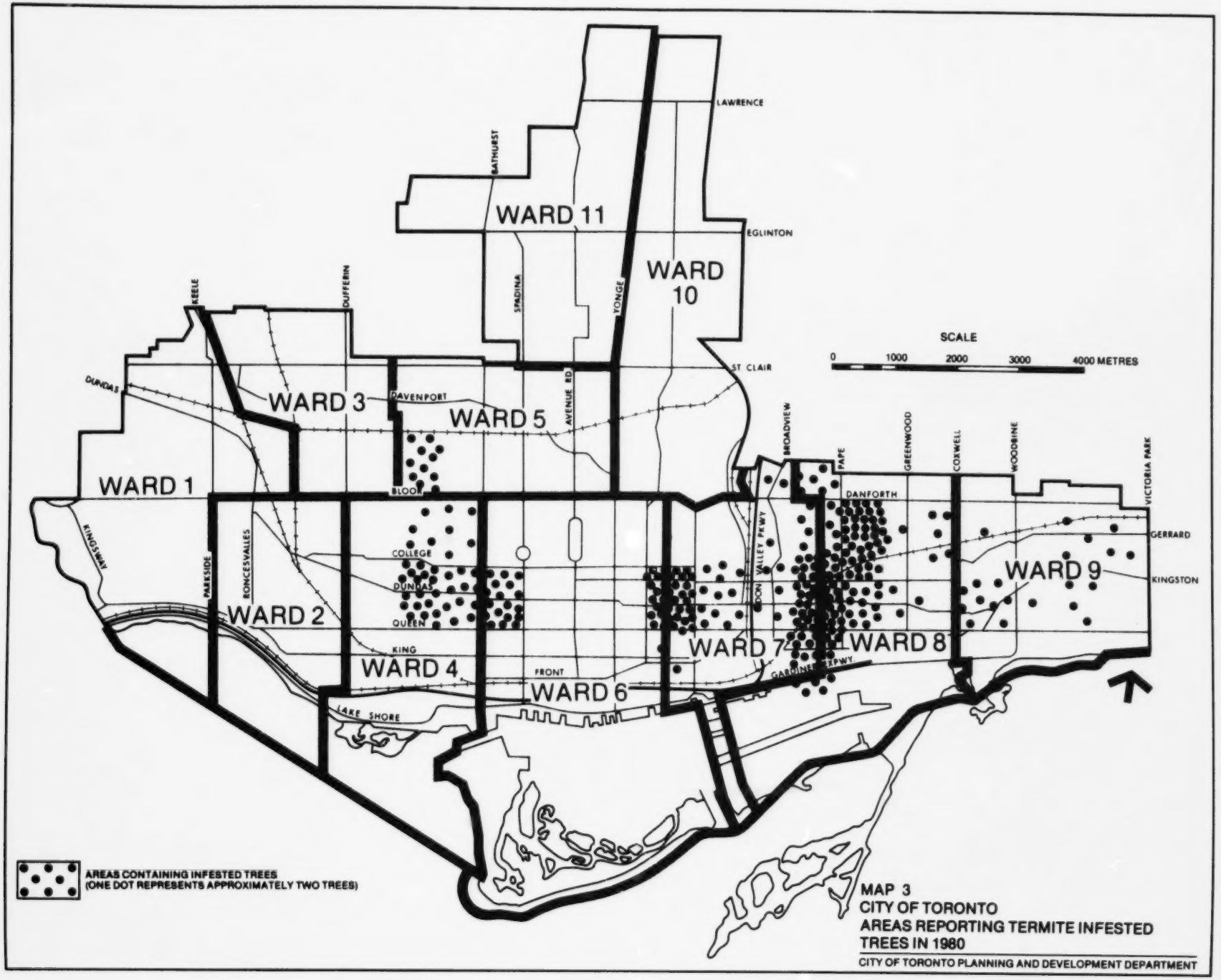
NOTE:

IF THE 67 BLOCKS WHICH WERE FOUND TO BE INFESTED PRIOR TO BUT IN WHICH NO HOUSES WERE TREATED BETWEEN 1966 AND 1982, ARE INCLUDED, THE TOTAL NUMBER OF BLOCKS SUBJECT TO INFESTATION WAS 446.

THE TOTAL NUMBER OF HOUSES TREATED WITHIN THE INFESTED BLOCKS IN THE CITY INCLUDED ABOUT 5% HOUSES TREATED FOR CARPENTER ANT INFESTATION. HOWEVER IN WARD[illegible]ND 11 ALL THE TREATED HOUSES AND BLOCKS WERE SUBJECT TO CARPENTER A[illegible]NFESTATION.

MAP 2
CITY OF TORONTO
INTENSITY OF TERMITE (AND CARPENTER ANT) INFESTATION IN BLOCKS WHERE HOUSES WERE TREATED, 1965 - 1982

CITY OF TORONTO PLANNING AND DEVELOPMENT DEPARTMENT



MAP 3
CITY OF TORONTO
AREAS REPORTING TERMITE INFESTED TREES IN 1980

CITY OF TORONTO PLANNING AND DEVELOPMENT DEPARTMENT

In terms of spatial growth, the number of blocks where one or more houses were treated rose from 25 in 1965 to 48 in 1966–70, to 56 in 1971–75 and, because of more extensive inspections and treatment activity, to 83 in 1976–80 and just for the two year period 1981–82 to 83.

Expressed in another way, on the average, houses were being treated in about ten new blocks per year in 1966–70. The average rose to about 12 in 1971–75 and to 17 per year in 1976–80. In the past two years, the average was more than 40 blocks per year (Figure 2).

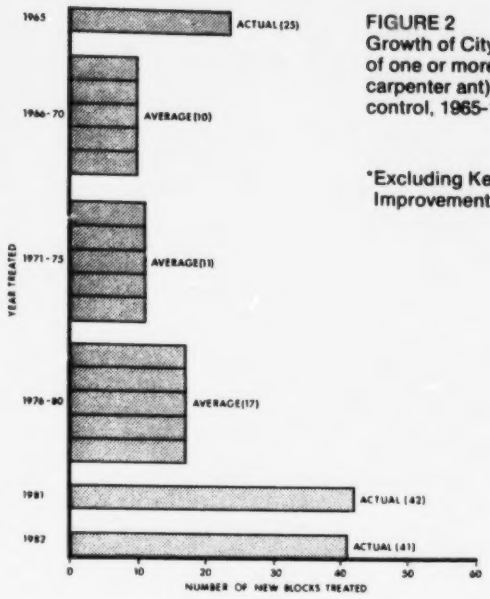


FIGURE 2
Growth of City blocks subject to treatment of one or more houses for termite (and carpenter ant) infestation under termite control, 1965-1982.*

*Excluding Kensington Neighbourhood Improvement Area and Wards 10 & 11.

East End Hardest Hit

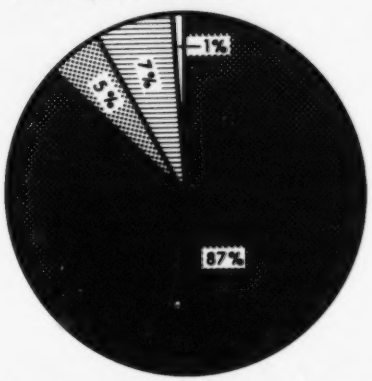
Although the termite problem is most serious in the east end, the highest intensity ratio (proportion of blocks where more than 20% of the houses were treated) occurs in Kensington (even after discounting treatment under the Neighbourhood Improvement Program). This is probably explained by the fact that Kensington is characterized by small attached houses concentrated in relatively small blocks. The remaining eight blocks in Ward 6 are outside Kensington, and fall in the "5% or less of the houses treated" category.

A survey in 1980 of about 12,000 municipally owned trees located in areas subject to termite infestation found 568 (5%) infested trees. The majority (72%) were in the east end (Figure 5 and Map 3). Though termites can do no significant damage to healthy trees, they can use trees as staging posts for damaging attacks on nearby properties if such properties are not already protected by means of a chemical treatment barrier.

Treatment Protects Properties, But Termites Just Move On

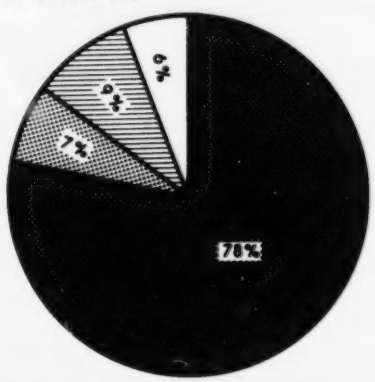
Chemical treatment of the soil around a building and of certain structural components, coupled with sound building and maintenance practices, can significantly reduce the risk of termite infestation. However, treatment of particular structures or spots which serve as a source of food to termites does not eradicate nearby termite colonies. Injection of insecticides into the ground underneath or around a structure kills the termites which happen to be there at the time. It also creates a long-term poisoned barrier which the termites cannot penetrate for as long as the treated area remains undisturbed and the effect of the chemicals persists. However, when termites are denied access to a property because of chemical treatment or other preventative measures, they send out foragers to attack other untreated properties.

FIGURE 3
Percentage distribution of 2,859* houses treated by area, 1965-1982.



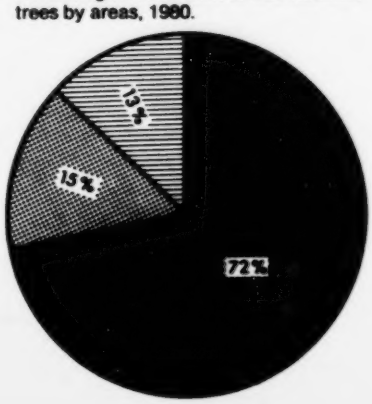
*Excluding Kensington Neighbourhood Improvement Area and Wards 10 & 11.

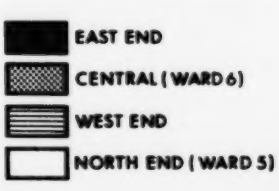
FIGURE 4
Percentage distribution of 295* blocks in which one or more houses were treated by area, 1965-1982.



*Excluding 6 blocks in the Kensington Neighbourhood Improvement Area and all the blocks in Wards 10 & 11.

FIGURE 5
Percentage distribution of 568 infested trees by areas, 1980.





The insecticides Chlordane and Aldrin are used in Toronto for termite control. Treatment with these, if performed properly, can be effective for as long as 30 years. Though both are toxic, they are known to move only a few inches over a long period to surrounding soil or sub-surface water, and are considered relatively safe. (The consultant's study now underway is expected to include an evaluation of Chlordane-Aldrin compared to alternative means of control, taking into account the environmental and health implications.)

A follow-up survey of treated houses was carried out in 1981 as part of this study, and confirmed the effectiveness of the treatment. In the 15 year period from 1965 to 1980, less than 4% of the treated houses required retreatment. And in most of these instances, reinfestation had occurred because direct contact between wood and soil had not been broken. Financial assistance for removing such contact became available to homeowners from late 1977. The incidence of reinfestation declined from 7.6% for the houses treated in 1966–70 to 1.6% for those treated in 1976–80, probably reflecting overall improvement in treatment.

Shelter tube

The Need for Action

This overview, and the more detailed report which accompanies it, point out the need for anti-termite action in several key areas:

- Research and development aimed at:
  - finding scientific means of detecting and eradicating termites in their colonies, before they attack properties;
  - finding equally effective but environmentally safer alternatives to the insecticides presently in use for treating and preventing termite infestation.
- An expanded program of grants and treatment for homes not yet infested but in areas susceptible to infestation.
- An improved public awareness and education program, aimed particularly at new homeowners in termite-prone areas, carried out by municipalities with provincial support.
- An expanded Termite Control Program in the City of Toronto, including sufficient resources for:
  - a more active inspection program that does more than just respond to requests;
  - inspection and enforcement of non-residential properties as well as housing;
  - adequate and timely record keeping to allow for ongoing monitoring of infestation and evaluation of the Program.
- Resolution of the technical issue of whether or not the use of pressure treated wood permitted by the Ontario Building Code in areas affected by termites is feasible without compromising the wood's immunity in the process of construction.
- A strategy for dealing with termites given the increased use of wood by homeowners in features or structures not regulated by the Ontario Building Code, such as decks, fences, flower boxes and other landscaping elements.

Termites are a threat to all buildings where structural wood members are used, especially housing in southern Ontario and potentially across Canada. This underlines the need for a concerted effort on the part of homeowners and all levels of government (local, provincial and federal) in the ongoing battle against termites.

For further information contact Anwar Jafri, Senior Research Officer, at 947-7185.

TERMITES IN TORONTO

— FACT SHEET —

- strain of termite found in Toronto — Eastern Subterranean Termite (Reticulitermes Flavipes or Kollar)

History

- first recorded in southern Ontario — 1929
- first recorded in Toronto — 1938
- significant property damage first recorded in Toronto — 1944
- seriousness of problem first recognized by the City — 1962
- enabling legislation passed by the Province of Ontario — 1963
- Termite Control Program established by the City — 1965
- larger provincial grants of up to $2,000 introduced — 1977

Costs and Grants

- maximum grant available to homeowners*:
  - Provincial, up to 60% of cost:
    - for wood - soil separation and chemical treatment combined: maximum — $2,000
    - for prior chemical treatment of sites before construction: maximum — $1,000
  - City:
    - for chemical treatment and/or repair of termite damage or chemical treatment of carpenter ant infestation, 25% of cost: maximum — $ 125
- average cost of treatment, 1982:
  - wood - soil separation work — $2,146
  - chemical treatment — $ 541
- average grant, 1982:
  - Province:
    - for wood - soil separation work — $1,102
    - for chemical treatment — $ 311
  - City:
    - for chemical treatment and/or repair of termite damage or chemical treatment of ant infestation — $ 121

*Reductions currently proposed under Green Paper

1 2
29 36 V

City Statistics

(Excluding 84 blocks and 95 homes in Wards 10 and 11 subject to carpenter ant infestation exclusively but including houses and blocks in Kensington Neighbourhood Improvement Program area.)

- percentage of treated houses which required wood -soil separation work — 66%
- number of City blocks in which one or more properties were found infested to end of 1982 — 362
  - as percentage of total residential City blocks — 15%
- number of residential blocks in which one or more houses were treated between 1965 and 1982 — 301
  - as percentage of total residential City blocks — 10%
- total number of house form residential buildings located in 362 blocks subject to infestation — 21,720
  - as percentage of total house form residential buildings in the City — 20%
- number of houses treated between 1965 and 1982 — 3,283
  - as percentage of house form residential buildings within 362 infested blocks — 15%
- areas hardest hit by infestation — east end of the City but problem spreading to other areas
- 96% of the houses treated in the City during past 16 years reported no reinfestation following treatment.

Advice and help available from the City's Buildings and Inspections Department:

- Wards 1, 2, 3 and 4: District Office, 1245 Dupont Street, 2nd Floor, Telephone 537-4461
- Ward 6: District Office, 75 Elizabeth Street, Telephone 947-7559
- Wards 7, 8 and 9: District Office, 765 Queen Street East, Telephone 469-5996.
- Wards 5, 10 and 11: District Office, 40 Orchard View Boulevard, Telephone 481-5631